

Did Italian banks trade-off lending with government bond purchases?

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Motivations

- With the sovereign debt crisis, many banks shifted their assets **from loans to domestic government bonds**
- Government bonds offered higher returns and were less risky than loans, and could also be used as **collateral** to access large and cheap financing from the ECB
- Has government debt **crowded out** bank lending in Italy, as many times in the past?
- Or was the drop in bank loans to the manufacturing sector due to a **reduction in credit demand**, caused by the recession?
- To answer this question we study government bond purchases and loan supply in over **100 Italian co-operative banks** lending to more than **2,500 firms** between 2012 and 2014

Reference literature

- We aim to contribute to three broad strands of literature:
 - 1 on the **determinants of bank purchases of sovereign securities** in the aftermath of the global financial crisis
 - 2 on the **impact of government debt on bank lending** to the private sector
 - 3 on the **transmission of a bank balance sheet shock to corporate credit** and its effects on the real economy

Bank sovereign purchases (1)

- During the European sovereign debt crisis, domestic **banks in stressed countries were more likely to buy sovereigns** (Ongena et al., 2016)
- By the end of 2013, the share of government debt held by the domestic banking sectors of Eurozone countries was more than twice that held in 2007 (Becker and Ivashina, 2014)
- According to the **'moral suasion' hypothesis**, countries in financial distress exert moral suasion on their banks (Battistini et al., 2013; Ongena et al., 2016; Acharya and Steffen, 2015)

Bank sovereign purchases (2)

- According to the **'renationalization hypothesis'**, banks attribute a lower degree of riskiness to domestic sovereigns than foreign investors during a crisis, augmenting the domestic bias (Angelini et al., 2014)
- ECB's LTRO was associated with a strong increase in the purchases of short term domestic government bonds by Portuguese banks (Carpinelli and Crosignani, 2015)

Government debt and bank lending

- The **sovereign spread significantly affects the cost of credit** for firms and households and exerts a negative effect on loan growth (Albertazzi et al., 2014; Neri, 2013)
- Firms were more likely to substitute loans with bonds when local banks **owned more risky domestic sovereign debt** (Becker and Ivashina, 2014)
- Banks **more exposed to the sovereign shock reduced their credit supply** and increased the interest rates on their loans more than less exposed ones (De Marco, 2016)
- Banks with **higher trading expertise** increased their investments in securities and reduced their credit supply to firms relatively more than banks with lower expertise (Abbassi et al., 2016)

Bank balance sheet shocks and corporate credit

- Lending contraction depressed **investment, job creation, and sales** of firms affiliated with banks that were hit relatively more strongly by the crisis (Acharya et al., 2016)
- The exogenous shock to sovereign securities held by financial intermediaries in Italy was passed on to firms through a contraction of credit supply
- It led to a reduction in investment and employment only for the smaller firms (Bottero et al., 2015)

A simple model (1)

- **Disentangling the demand and supply determinants** of changes in bank lending is a well known problem in the banking literature
- To address this identification problem we borrow from **Khwaja and Mian (2008)**

A simple model (2)

- Consider a **profit maximizing bank** i with a marginal cost of funding of:

$$\bar{d}_{it} + \alpha_d D_{it}$$

- The bank can use the funds that it has raised:
 - to **grant loans** to a borrower j
 - to **acquire government bonds**
- The marginal return from lending to a generic borrower j at time t is L_{ijt} :

$$\bar{r}_{it} - \alpha_l L_{ijt} \tag{1}$$

- Government bonds at time t give a flat return $r_t^b + \theta$

A simple model (3)

- Assume that at time $t + 1$ the economy is hit by an exogenous shock that impacts on:
 - 1 the returns on government bonds (γ)
 - 2 the demand for bank loans by firm j (η_j) and ($\bar{\eta}$)
 - 3 the spread required by the bank (κ)
 - 4 the supply of bank loans by bank i (ζ_i)

Disentangling the demand effect from the supply effect

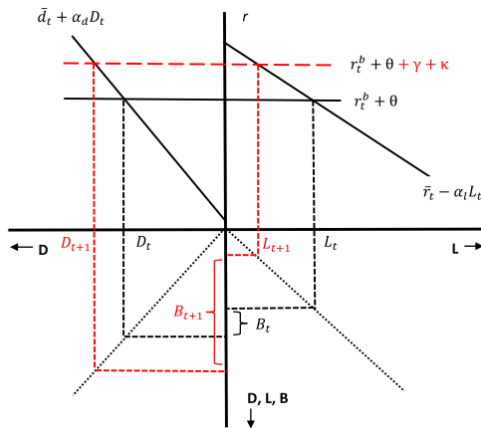


Figure: Bank's balance sheet equilibrium

The empirical model

- From the previous expression we can obtain the following empirical model:

$$\Delta L_{ijt} = \varphi_1 \Delta B_{it} + \varphi_2 \textit{Dummy firm}_{jt} \\ + \varphi_3 \textit{Dummy bank}_i + \varphi_4 \textit{Bank characteristics}_{it} + \epsilon_{ijt}$$

- Firm-specific shocks are controlled for by *Dummy firm_{jt}*
- Shocks to bank loan supply are captured by *Bank characteristics_{it}*

Data sources

- On the **bank side**, we use **Bankscope** records, that provide balance sheet information information for all cooperative banks in our sample
- Data on **bank-firm relationships** include detailed information on the credit lines granted on checking accounts and on long-term loans collected by **CRIF and CSD**
- The sample includes **2,504 firms** and **105 co-operative banks** located in different region across Italy (60 per cent in the North, 23 per cent in the South)

Relationship specific characteristics excluding zeros

	(1 - c/lines)	(2 - c/lines)	(3 - t/loans)	(4 - t/loans)
Δ Government bonds	-0.054* (0.03)	-0.054* (0.03)	-0.119* (0.07)	-0.114 (0.07)
Tier1 capital ratio	-0.001** (0.00)	-0.001** (0.00)	-0.001** (0.00)	-0.001*** (0.00)
ROA	-0.045 (0.06)	-0.052 (0.06)	-0.377** (0.15)	-0.376** (0.15)
Interbank ratio	-0.018 (0.71)	0.115 (0.71)	-2.479 (2.49)	-2.389 (2.49)
Bank share c/lines	0.000 (0.00)	0.000 (0.00)		
Relationship length		-0.003** (0.00)		-0.009** (0.00)
Banks share t/loans			-0.002* (0.00)	-0.002 (0.00)
Observations	7,281	7,179	3,060	3,026
Adjusted R^2	0.082	0.085	0.262	0.268

Robustness checks

- We have conducted a number of robustness checks of our baseline results:
 - ① including also firms with **lending relationships with only one bank**, controlling for credit demand by including the time-varying firm-specific fixed effects obtained from the baseline specification
 - ② **normalizing** the dependent variable and the main explanatory variable with the level of total assets in the **previous year** (instead of the beginning of the period)

Additional results

- We have provided a number of additional results:
 - 1 including the interaction with the **initial bond holding**
 - 2 adopting as dependent variable a dummy indicating an **increase** in credit line (or term loan) as well as a **decrease** (instead of the change)
 - 3 as dependent variable a dummy indicating a **new starting lending relationship** in credit line (or term loan) as well as an existing one that is **severed** (instead of the change)

Relationship specific characteristics including zeros

	(1 - c/lines)	(2 - c/lines)	(3 - t/loans)	(4 - t/loans)
Δ Government bonds	-0.080*** (0.03)	-0.081*** (0.03)	-0.084** (0.04)	-0.088** (0.04)
Tier1 capital ratio	-0.000 (0.00)	-0.000* (0.00)	-0.000 (0.00)	-0.000 (0.00)
ROA	-0.022 (0.04)	-0.026 (0.04)	-0.230** (0.11)	-0.236** (0.11)
Interbank ratio	-0.767 (0.62)	-0.694 (0.62)	0.979 (1.46)	0.889 (1.48)
Bank share c/lines	0.001*** (0.00)	0.001*** (0.00)		
Relationship length		-0.003** (0.00)		-0.003** (0.00)
Bank share t/loans			-0.001** (0.00)	-0.001** (0.00)
Observations	9,763	9,653	7,933	7,837
Adjusted R^2	0.069	0.071	0.114	0.117

Increase of lending

	Credit lines		Term loans	
	(1)	(2)	(3)	(4)
Δ government bonds	-0.488*** (0.17)	-0.475*** (0.16)	-0.480*** (0.16)	-0.485*** (0.16)
Tier1 capital ratio	-0.210 (0.13)	-0.202 (0.13)	-0.148 (0.11)	-0.147 (0.11)
ROA	-0.148 (0.20)	-0.140 (0.19)	-1.178*** (0.41)	-1.176*** (0.42)
Interbank ratio	-7.303*** (2.77)	-7.267*** (2.73)	-4.781 (4.04)	-4.948 (4.08)
Bank share credit line	0.971*** (0.09)	0.992*** (0.10)		
Relationship length		-0.004 (0.00)		-0.002 (0.00)
Bank share term loans			2.436*** (0.18)	2.445*** (0.18)
Observations	9,763	9,653	7,933	7,837
Adjusted R^2	0.147	0.149	0.220	0.221

Relationship specific characteristics including zeros

	Credit lines (1)	Term loans (2)
Δ government bonds	-0.482** (0.19)	-0.314 (0.55)
Share of government bonds over total assets (lagged) x Δ government bonds	1.159** (0.55)	0.916 (1.54)
Share of government bonds over total assets (lagged)	-0.043*** (0.01)	0.016 (0.04)
ROA	0.022 (0.05)	-0.369*** (0.14)
Tier1 capital ratio	-0.008 (0.03)	-0.152** (0.07)
Interbank ratio	-0.944 (0.76)	-2.287 (2.62)
Observations	7,293	3,060
Adjusted R^2	0.083	0.259

Relationship specific characteristics including zeros

	Credit lines		Term loans	
	New	Severed	New	Severed
Δ government bonds	-291.900** (122.47)	17.801 (61.50)	-305.689*** (81.56)	-41.674 (42.51)
ROA	-222.031* (127.01)	120.121* (71.15)	-715.104*** (264.39)	290.899*** (68.24)
Tier1 capital	-192.239** (78.40)	42.450 (39.95)	-46.818 (52.43)	115.957** (44.88)
Interbank ratio	-1333.431 (1543.38)	-1395.783 (1184.52)	-3507.764** (1729.08)	-1156.209 (1189.27)
Observations	12,721	12,721	14,372	14,372
Adjusted R^2	0.170	0.337	0.124	0.105

Conclusions

- The sovereign crisis of 2011 had a **severe impact on bank lending** in Italy
- We find convincing evidence of a **crowding out effect**, with banks that acquired a larger amount of government bonds reducing relatively more their supply of both lines of credit and long-term loans to firms